REPORT

ON

AUDIT & ASSESSMENT OF QUALITY OF SERVICE

OF

CELLULAR MOBILE TELEPHONE SERVICE

FOR

NORTH ZONE – JAMMU & KASHMIR CIRCLE

Report Period: April 2011 – June 2011

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CHAPTER-1: INTRODUCTION

I.   Background

TRAI's mission is to create and nurture conditions for growth of telecommunications in the country in a manner and at a pace, which will enable India to play a leading role in emerging global information society. One of the main objectives of Telecom Regulatory Authority of India (TRAI) is to provide a fair and transparent policy environment, which promotes a level playing field and facilitates fair competition.

In pursuance of above objective TRAI has issued from time to time a large number of regulations, orders and directives to deal with issues coming before it and provided the required direction to the evolution of Indian telecom market from a Government owned monopoly to a multi-operator multi service open competitive market.

The directions, orders and regulations issued cover a wide range of subjects including tariff, interconnection and quality of service as well as governance of the Authority.

The purpose of laying down Quality of Service Parameters is to:

i)   Create conditions for consumer satisfaction by making known the quality of service, which the service provider is required to provide, and the user has a right to expect.

ii)   Measure the Quality of Service provided by the Service Providers from time to time and to compare them with the norms so as to assess the level of performance.

iii)   Generally protect the interests of consumers of telecommunication services.

TRAI has been carrying out regular reviews of the status of quality of service of the networks of all operators. In continuation to these efforts, TRAI has selected through bidding process TCIL as the Audit Agency to audit and assess the Quality of Service rendered by the service providers' namely Basic (Wireline) Services, Cellular Mobile Telephone (Wireless) Services and Broadband Services. The Audit for various telecom circles within the Zones has been distributed across four quarterly periods.

The parameters that need to be measured for Basic and Cellular Mobile Services have been specified in the TRAI notification on Quality of Service of Basic (Wire line) and Cellular Mobile (wireless) Services, 2009. The parameters for Broadband Services have been specified in the TRAI notification for Quality of Services of Broadband Service Regulation, 2006.

II.   Objectives and Methodology

The primary objective is to audit and assess the Quality of Service being rendered by Basic, Cellular Mobile & Broadband services against the parameters notified by TRAI. The audit and assessment of Quality of Service is conducted for all the basic service providers, unified access service providers, cellular mobile service providers and ISPs (Internet Service Provider) for basic wire line, Cellular Mobile Telephone Services and broadband service. TCIL has undertaken the following audit works as per the Terms of Reference (TOR):

i)   Verification of the data submitted by the service providers to TRAI as part of QoS monitoring reports i.e. Quarterly Performance Monitoring Reports (PMRs) and monthly Point of Interconnection (POI) Congestion Reports with reference to the records maintained by the service provider.

ii)   Verification of the performance of service providers against the Quality of Service benchmarks laid down by TRAI using live measurement for 3 days during the month in which the audit and assessment is carried out.

iii)   Verification of the performance of service providers against the Quality of Service benchmarks laid down by TRAI using the data for the entire month during which the live measurement is carried out.

iv)   Drive tests of the mobile networks both operators assisted and independent drive test (as and where required).

v)   Billing and call center's data verification.

vi)   Live testing of the efficiency of the call center / customer care help line.

To fulfill the above mentioned Scope of Work audit was performed on different Systems, Facilities and Field data collection.

Systems audited:-

1. Network Switching Centre (NSS)
2. Base Station Subsystem(BSS)
3. Billing Applications
4. Customer Care applications

Facilities audited:-

1. Billing documents.
2. Customer Care records.

Field data collections carried out:-

1. RF network coverage including KPIs (Key Performance Index)
2. Inter Operator Call Assessment
3. Checking of Customer Billing/Refund Complaints (Random sample)
4. Customer Care efficiency
5. The live calling was made to assess the quality of services for Inter Operator Call Assessment, Customer Billing/Refund Complaints and Customer Care efficiency.

In order to carry out the above scope of work:-

✓ TCIL auditors visited all the NSS (Network Sub System) and BSS (Base-station Sub System) to check data for all the operators in their respective service area.

✓ All the NSS and BSS data for the relevant details were collected either directly from the centralized NOC or through a remote access to the NOC.

✓ The Radio parameters were audited/verified from the data collected from OMC-R (Operation and Maintenance Center – Radio, as part of BSS data).

✓ The Drive test was conducted in high, low and medium dense areas including highways, commercial complex and residential areas and special attention was paid for the areas for which TRAI has received complaints.

✓ The POI and other network related parameters were audited/verified from the data collected from the OMC-S (Operation and Maintenance Center – Switch as part of NSS data).

✓ The data related to Billing and Customer care was checked for the previous month and verified with the customers by calling them on random basis. The process of registration and handling of the complaints was also studied for the various operators. Call centre number were called for measuring the efficiency of the call centre.

✓ The inter operator call assessment test was carried out during the time period as is specified in the tender document. TCBH (Time Consistent Busy Hour) is taken after observation of the traffic consistently for 3 days prior to the audit activity.

✓ Data has been collected for busy hour of network in case of live assessment & month of audit for all service providers & verified that service providers are providing busy hour data only for QoS service. We found that TCBH hour is matching with network busy hour as provided by service providers for Jammu & Kashmir circle. But for parameters such as 'Worst affected cell exceeding 3% TCH drop' and 'BTSs accumulated down time' CBBH (Cell Bouncing Busy Hour) was taken instead of TCBH (Time Consistent Busy Hours) as per the TRAI new regulation 2009. This has resulted in high value for 'Cell exceeding 3% TCH drop' parameter for some of the service providers.

CHAPTER-2: EXECUTIVE SUMMARY

I.   Preface

This report highlights the findings for the audit & assessment of Quality of Service of Cellular Mobile Services in Jammu & Kashmir Circle in 2nd quarter (April – June 2011). The primary data collection and verification of records (PMR data verification – quarterly) maintained by various operators was undertaken during the period October – December 2010.

Following are the various operators covered in Jammu & Kashmir circle (NORTH Zone) for Cellular Mobile (Wireless) services QoS audit & assessment. The Month of audit & TCBH information is also given below:

Sl.	Name of Service Provider	Month of Audit	TCBH Hour
GSM Operators			
1	Aircel Ltd	June-2011	2000-2100 Hrs
2	Airtel Ltd	June-2011	2000-2100 Hrs
3	BSNL	June-2011	2000-2100 Hrs
4	Idea	June-2011	2000-2100 Hrs
5	Reliance Communication (GSM)	April-2011	2000-2100 Hrs
6	Vodafone	June-2011	2000-2100 Hrs
CDMA Operators			
7	Tata Communications (CDMA)	June-2011	2000-2100 Hrs

II.   Findings from Quality of Service Audit (Operator wise for each parameter)

(A)   Cellular Mobile Telephone Services

S/N	3 days Live Data Audit — Name of Parameter	Bench-mark	Aircel	Airtel	BSNL	Idea	Rcom GSM	Vodafone	Tata CDMA
						GSM Operators			
1	**Connection Establishment (Accessibility)**								
	a) CSSR (Call Setup Success Rate)	>=95%	96.41%	99.18%	97.00%	99.30%	98.00%	98.80%	99.26%
	b) SDCCH/PAGING congestion	<=1%	0.52%	0.17%	0.90%	0.18%	0.17%	0.29%	0.00%
	c) TCH congestion	<=2%	3.01%	0.20%	1.90%	0.11%	0.91%	0.20%	0.15%
2	**Connection maintenance (Retainability)**								
	a) CDR	<=2%	1.20%	0.83%	2.00%	1.77%	0.33%	1.60%	0.73%
	b) Worst affected cells>3% TCH drop	<=3%	6.72%	1.74%	4.67%	2.75%	0.82%	4.65%	0.81%
	c) Good voice quality	>=95%	92.01%	98.91%	NA	96.49%	96.51%	97.56%	NA
3	**No of POI having >0.5% congestion**		1	0	0	0	0	0	0
4	**Response time to customers for assistance**								
	a) Accessibility of call centre/Customer Care	>=95%	100%	95%	100%	100%	100%	100%	98.00%
	b) % call answered by operators(voice to voice) within 60 sec.	>=90%	74.00%	90%	90.00%	93.00%	92.00%	95.00%	81.00%

NA: Not Applicable, NR: Not Received

From the 3 days live data assessment, it is found that all the operators are meeting the network parameters by and large, except for Aircel, BSNL and Vodafone are not meeting the benchmark for "Worst affected cells>3% TCH drop" with the value of 6.72%,4.67% and 4.65% respectively. In TCH congestion, Aircel is not meeting the benchmark with the value of 3.01%. Good Voice quality is not met by Aircel (92.01%).

Performance related to customer care data is not found to be satisfactory for some of the operators like Aircel and Tata CDMA especially for the parameter "calls answered by operators (voice-to-voice)".

Month data assessment

S/N	Name of Parameter	Bench-mark	Aircel	Airtel	BSNL	Idea	Rcom GSM	Vodafone	Tata CDMA
	One Month Data Audit								
					GSM Operators				
(A)	Network Service Quality Parameter								
1	Network Availability								
	a) BTS Accumulated Downtime	<=2%	0.13%	0.18%	1.95%	0.21%	0.36%	0.00%	0.13%
	b) Worst affected BTSs due to downtime	<=2%	0.17%	0.83%	1.97%	0.88%	1.30%	0.00%	0.00%
2	Connection Establishment (Accessibility)								
	a) CSSR (Call Setup Success Rate)	>=95%	96.20%	99.15%	96.50%	99.34%	97.00%	99.00%	99.28%
	b) SDCCH/PAGING congestion	<=1%	0.49%	0.14%	0.90%	0.17%	0.15%	0.27%	0.00%
	c) TCH congestion	<=2%	3.25%	0.17%	1.90%	0.21%	0.77%	0.31%	0.16%
3	Connection maintenance (retainability)								
	a) CDR	<=2%	1.15%	0.81%	2.00%	1.56%	0.33%	1.51%	0.82%
	b) Worst affected cells>3% TCH drop	<=3%	6.21%	1.65%	4.84%	2.94%	0.90%	4.61%	0.58%
	c) Good voice quality	>=95%	92.46%	98.68%	NA	96.78%	96.02%	97.50%	NA
4	No of POI's having>0.5%congestion		1	0	0	0	0	0	0
(B)	Customer Service Quality Parameters								
5	Metering/billing credibility-Post paid	<= 0.1%	0.00%	0.01%	0.10%	0.00%	0.10%	0.00%	0.00%
6	Metering /billing credibility-Pre paid	<= 0.1%	0.04%	0.02%	0.06%	0.05%	0.01%	0.02%	0.00%
7	Resolution of billing/ charging complaints	100% within 4 weeks	100%	100%	99.56%	100%	100.0%	100%	100%
	a) Period of applying credit/waiver/adjustment to the customer's account from the date of resolutions of complaints	<=1 week	100%	100%	100%	100%	100%	100%	100%
8	Response time to customers for assistance								
	a) Accessibility of call centre/Customer	>=95%	93.56%	93.49%	100%	100%	100%	100%	99.88%

	Care								
	b) % call answered by operators(voice to voice) within 60 sec.	>=90%	93.16%	93.50%	95.00%	96.00%	92.00%	95.00%	95.00%
9	**Termination/closure of service**	<=7days	100%	100%	100%	100%	100%	100%	100%
10	**Time taken for refunds of deposits after closures.**	100% within 60 days	100%	100%	100%	100%	100%	100%	100%

NA: Not Applicable, NR: Not Received

From the month data assessment, it is found that all the operators are meeting the network parameters by and large, except Aircel, BSNL and Vodafone not meeting the benchmark for "Worst affected cells>3% TCH drop" with the value of 6.21%,4.84% and 4.61% respectively.

Besides that Aircel is also not meeting the some parameters like TCH congestion and Good voice quality. Resolution of Billing complaints is not met by BSNL only.

Performance related to Response time to customers for assistance data is found to be satisfactory for all the operators especially for the parameter "calls answered by operators (voice-to-voice)". A below benchmark performance is observed in case of Airtel (93.49%) and Aircel (93.56%) for "accessibility of call centre" parameter.

Operator-Assisted Drive Test

The Operator Assisted Drive Test was conducted at Jammu and Kashmir for all the operators. Route covered was about around 100-130Km depending on city areas within the speed limit of 30Km/hr. The cities covered were Jammu, Srinagar and Baramulla. In all the cities, zones were selected for covering different density areas (High, Medium & Low dense areas).

SN	Parameter	City Name	Aircel	Airtel	BSNL	Idea	Rcom GSM	Vodafone	Tata CDMA
			GSM Operators						
1.1	Blocked Call Rate (<=3%)	Jammu	1.06%	0.00%	1.45%	1.00%	3.06%	0.00%	0.00%
		Srinagar	0%	0%	1.24%	0.01%	1.58%	3.59%	0.00%
		Baramulla	0%	0%	1.43%	1.00%	1.98%	0%	1.00%
1.2	Dropped Call Rate (<=2%)	Jammu	0%	0%	1.45%	0.00%	1.02%	0%	1.68%
		Srinagar	0%	0%	1.24%	1.00%	2.38%	0%	1.94%
		Baramulla	0%	0.83%	0.71%	0%	0.00%	0.93%	0.00%
1.3	Percentage of connections with good voice quality (=>95%)								
	(i) 0-4 (w/o frequency hopping)	Jammu							91.43%
		Srinagar							92.00%
		Baramulla							93.50%
	(ii) 0-5 (with frequency hopping)	Jammu	94.90%	96.70%	97.10%	95.80%	94.99%	98.30%	
		Srinagar	95.35%	95.40%	95.70%	96.46%	92.64%	97.84%	
		Baramulla	94.29%	97.30%	95.65%	98.03%	96.41%	99.50%	
1.4	Call Setup Success Rate (>=95%)	Jammu	98.94%	100%	98.55%	99.00%	96.94%	100%	100%
		Srinagar	100%	100%	98.76%	99.99%	98.42%	96.41%	100%
		Baramulla	100%	100%	98.57%	99.00%	98.02%	100%	99%

Key observations as could be derived from the table are as under:

• Blocked Call Rate benchmark is not met by Vodafone in Srinagar (3.59%) & Rcom GSM in Jammu   (3.06%)

• Dropped Call Rate benchmark is not met by Rcom GSM in Srinagar with (2.38%) .

• Tata CDMA is not meeting in all 3 cities while as GSM operators Aircel is only in Jammu & Baramulla and Rcom GSM in Jammu & Srinagar with a value of (94.99%) and (92.64%) .

Independent Drive Test

The Independent Drive Test was conducted at Srinagar. Here again, zones were selected for covering different density areas (High, Medium & Low dense areas).

SN	Parameter	City Name	Aircel	Airtel	Idea	Rcom GSM	Vodafone	BSNL
			GSM Operators					
1.1	Blocked Call Rate (<=3%)							
		Srinagar	0%	0%	0%	1.14%	2.41%	1.11%
1.2	Dropped Call Rate (<=2%)							
		Srinagar	0%	0%	0%	0%	0%	1.11%
1.3	Percentage of connections with good voice quality (=>95%)							
	(i) 0-4 (w/o frequency hopping)	Srinagar						
	(ii) 0-5 (with frequency hopping)	Srinagar	95.93%	96.80%	95.66%	95.18%	98.50%	96.00%
1.4	Call Setup Success Rate (>=95%)							
		Srinagar	100%	100%	100%	98.86%	97.59%	98.89%

Key observations as could be derived from the table are as under:
• All operators have satisfied the benchmark.

III.   AUDIT-PMR Verification

I. Cellular Mobile Telephone Service

S/N	Name of Parameter	Bench-mark	Audit	Aircel	Airtel	BSNL	Idea	Rcom GSM	Vodaf one	Tata CDMA
PMR										
						GSM Operators				
(A)	**Network Service Quality Parameter**									
1	**Network Availability**									
	BTS Accumulated Downtime	*<=2%*	Reported	0.09%	0.11%	1.99%	0.15%	0.34%	0.00%	0.01%
			Verified	0.09%	0.11%	1.99%	0.15%	0.34%	0.00%	0.01%
	Worst affected BTSs due to downtime	*<=2%*	Reported	0.18%	0.37%	1.83%	0.57%	1.21%	0.00%	0.00%
			Verified	0.18%	0.37%	1.83%	0.57%	1.21%	0.00%	0.00%
2	**Connection Establishment (Accessibility)**									
	CSSR (Call Setup Success Rate)	*>=95%*	Reported	95.62%	99.25%	98.00%	99.45%	99.68%	99.45%	99.51%
			Verified	95.62%	99.25%	98.00%	99.45%	99.68%	99.45%	99.51%
	SDCCH/PAGING congestion	*<=1%*	Reported	0.51%	0.09%	0.90%	0.14%	0.05%	0.15%	0.00%
			Verified	0.51%	0.09%	0.90%	0.14%	0.05%	0.15%	0.00%
	TCH congestion	*<=2%*	Reported	3.05%	0.09%	1.90%	0.18%	0.42%	0.17%	0.02%
			Verified	3.05%	0.09%	1.90%	0.18%	0.42%	0.17%	0.02%
3	**Connection maintenance (retain ability)**									
	CDR	*<=2%*	Reported	1.70%	0.81%	2.00%	1.32%	0.27%	1.13%	0.39%
			Verified	1.70%	0.81%	2.00%	1.32%	0.27%	1.13%	0.39%
	Worst affected cells>3% TCH drop	*<=3%*	Reported	11.76%	0.95%	4.87%	8.43%	1.74%	4.53%	0.38%
			Verified	11.76%	0.95%	4.87%	8.43%	1.74%	4.53%	0.38%
	Good voice quality	*>=95%*	Reported	91.33%	98.64%	98.00%	97.45%	98.05%	98.07%	99.35%
			Verified	91.33%	98.64%	98.00%	97.45%	98.05%	98.07%	99.35%
4	**No. of POI's having >0.5%**		Reported	0	0	0	0	0	0	0
	congestion		Verified	0	0	0	0	0	0	0

(B)	Customer Service Quality Parameters										
5	**Metering/billing credibility-Post paid**	<= 0.1%	Reported	0.15%	0.01%	0.01%	0.00%	0.07%	0.03%	0.04%
			Verified	0.15%	0.01%	0.01%	0.00%	0.07%	0.03%	0.04%
6	**Metering /billing credibility-Pre paid**	<= 0.1%	Reported	0.01%	0.03%	0.05%	0.01%	0.03%	0.03%	0.40%
			Verified	0.01%	0.03%	0.05%	0.01%	0.03%	0.03%	0.40%
7	**Resolution of billing/ charging complaints**	*100% within 4 weeks*	Reported	100%	100%	92%	100%	100%	100%	100%
			Verified	100%	100%	92%	100%	100%	100%	100%
	Period of applying credit/waiver/adjustment to the customer's account from the date of resolutions of complaints	*<=1 week*	Reported	100%	100%	100%	100%	100%	100%	100%
			Verified	100%	100%	100%	100%	100%	100%	100%
8	**Response time to customers for assistance**									
	Accessibility of call centre/Customer Care	*>=95%*	Reported	100%	97.00%	100%	92%	96%	100%	95%
			Verified	100%	97.00%	100%	92%	96%	100%	95%
	% call answered by operators(voice to voice) within 60 sec.	*>=90%*	Reported	80.71%	49%	91.00%	56%	79%	99.00%	86%
			Verified	80.71%	49%	91.00%	56%	79%	99.00%	86%
9	**Termination/closure of service**									
	No. of requests for Termination / Closure of service complied within 7 days during the quarter	*<=7days*	Reported	100%	100%	100%	100%	100%	100%	100%
			Verified	100%	100%	100%	100%	100%	100%	100%
10	**Time taken for refunds of deposits after closures.**	*100% within 60 days*	Reported	100%	100%	100%	100%	100%	93%	80%
			Verified	100%	100%	100%	100%	100%	93%	80%

Critical Analysis (PMR Verification):

a. The figures proved by all the operators match the figures obtained on verification.

b. Vodafone, BSNL, Idea & Aircel are not meeting the benchmark for the parameter "Worst affected cells>3% TCH drop" with high margins.

c. In case of TCH congestion, only Aircel (3.05%) are not meeting the benchmark with high margins.

d. BSNL is not meeting the benchmark for "Resolution of billing/ charging complaints within 4 weeks".

e. Accessibility of Idea's Customer Care Centre is very poor (92%).

f. "% call answered by operators (voice to voice) within 60 sec." benchmark is only met by BSNL and Vodafone.

g. Tata-CDMA and Vodafone is not meeting the 60 days' benchmark for "Refund of deposits after closure of connection".

IV. DETAILED FINDINGS & ANALYSIS
I. Cellular Mobile Telephone Service
(A) MSC Audit
(1) 3 Days Live Data Assessment & Summarized Findings

S/N	Name of Parameter	Benchmark	Aircel	Airtel	BSNL	Idea	Rcom GSM	Vodafone	Tata CDMA
			GSM Operators						CDMA
A	Network Service Quality Parameter								
1	Connection Establishment (Accessibility)								
	a) CSSR	>=95%	96.41%	99.18%	97.00%	99.30%	98.00%	98.80%	99.2%
	b) SDCCH/PAGING congestion	<=1%	0.52%	0.17%	0.90%	0.18%	0.17%	0.29%	0.00%
	c) TCH congestion	<=2%	3.01%	0.20%	1.90%	0.11%	0.91%	0.20%	0.15%
2	Connection maintenance								
	a) CDR	<=2%	1.20%	0.83%	2.00%	1.77%	0.33%	1.60%	0.73%
	b) Cells having > 3% TCH drop	<=3%	6.72%	1.74%	4.67%	2.75%	0.82%	4.65%	0.81%
	c) Good voice quality	>=95%	92.01%	98.91%	NA	96.49%	96.51%	97.56%	NA
	d) No. of cells > 3% TCH drop		353	122	136	37	21	148	7
	e) Total no. of cells in the network		5,250	7,017	2,915	1,346	2,547	3,186	860
3	No of POI having >0.5% congestion .		1	0	0	0	0	0	0
	a) Name of POI not meeting the benchmark		Switch AT Completed for 63 E1's,Commissioning Letter Under-process, OVERFLOW ON L1 TAX JAMMU	NIL	NIL	NIL	NIL	NIL	NIL
	b) Total No. of circuits on POI		55070	53060	19124	151080	7864	22776	8205
	c) Avg No. of call attempts on POI		1607847	48385	12696	71981	7872	9477	1142
	d) Avg traffic served on POI (Erlang)		538	813	178	2078.5	192	192	29

	e) Total number of working POI Service Area wise		46	32	22	14	20	39	38
	f) Equipped Capacity of Network in respect of Traffic in erlang		110840	133209	61000	11306	40000	23973	35260
	g) Total traffic handled in TCBH in erlang		51585	81575	64397	3986	15776	18081	10664
(B)	**Customer Service Quality Parameters**								
4	**Response time to customers for assistance**								
	a) Accessibility of call centre	*>=95%*	100.00%	95%	100%	100%	100%	100.00%	98%
	b) % of call answered by operators(voice to voice) within 60 sec	*>=90%*	74.00%	90%	90%	93.00%	92.00%	95.00%	81%
	c) No. of call attempts to call centre / customer care nos. during TCBH (Avg)		100	100	100	100	100	100	100
	d) No. of calls connected and answered successfully to call centre / customer care nos. during TCBH (Avg)		74	90	90	93	92	95	81

NA: Not Applicable, NR: Not Received

Parameter-wise Findings (Live Data Assessment):

The parameter wise key takeouts for the Cellular Mobile Telephone Services providers in Jammu & Kashmir Service Area are as given below:-

➢ **Call setup success rate (benchmark >= 95%):** All operators are meeting the benchmark with values lying between 96.41% and 99.30%.
➢ **SDCCH/PAGING Channel congestion (benchmark <= 1%):** All the operators are meeting the benchmark with values lying between 0% and 0.90%.
Note: CDMA operators have provided the data for Paging Channel congestion and GSM operators provided SDCCH Channel congestion.

➢ **TCH congestion (benchmark <= 2%):** Except for Aircel with a value of 3.01% rest of the operators are meeting the benchmark with values lying between 0.11% and 1.90%.
➢ **Call drop rate (benchmark <= 2%):** All operators are meeting the benchmark with values lying between 0.33% and 2.00%.
➢ **Cell exceeding 3% TCH drop (benchmark <= 3%):** Except for Aircel, BSNL and Vodafone with a value of 6.72% , 4.67% and 4.65% respectively, rest of the operators are satisfying the benchmark with value in between 0.81% and 2.75%.
➢ **Connections with good voice quality (benchmark >= 95%):** Except Aircel with a value of 92.01%, all the GSM operators are meeting the benchmark with values lying between 96.49% and 98.91%.
➢ **No. of POI's having>0.5% Congestion :** Except for Aircel with the congestion in 1 POI, Rest all the operators are meeting the benchmark with value in between 0% and 0.03%. There was no congestion found overall on the POI, but cases were found where individual POIs are showing high utilization/usage. Some are in the range of over 100% though causing no traffic failure due to overflow technique i.e. the extra traffic is carried over by some other operating POI as has been designed to do so.
➢ **%age of call answered by operator (electronically) (benchmark >95%):** All operators are meeting the benchmark with values lying between 95.00% to 100%.
➢ **%age of call answered by operator (Voice to voice) (benchmark >90%): %):** Except for Aircel & Tata CDMA, all the operators are meeting the benchmark.

(2) Month Data Assessment & Summarized Findings

S/N	Name of Parameter	Benchmark	Aircel	Airtel	BSNL	Idea	Rcom GSM	Vodafone	Tata CDMA
			GSM Operators						CDMA
(A)	**Network Service Quality Parameter**								
1	**Network Availability**								
	a) BTS Accumulated Downtime	<=2%	0.13%	0.18%	1.95%	0.21%	0.36%	0%	0.13%
	b) Worst affected BTSs due to downtime	<=2%	0.17%	0.83%	1.97%	0.88%	1.30%	0%	0%
	c) Total no. of BTSs in the licensed service area		1,762	2,399	1,068	455	849	1,088	268
	d) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		1,608	3,155	15,002	696	2,192	0	251
	e) No. of BTSs having accumulated downtime of >24 hours in a month		3	20	21	4	11	0	0
2	**Connection Establishment (Accessibility)**								
	a) CSSR (Call Setup Success Rate)	>=95%	96.20%	99.15%	96.50%	99.34%	97.00%	99.00%	99.28%
	b) SDCCH/PAGING congestion	<=1%	0.49%	0.14%	0.90%	0.17%	0.15%	0.27%	0.00%
	c) TCH congestion	<=2%	3.25%	0.17%	1.90%	0.21%	0.77%	0.31%	0.16%
3	**Connection maintenance (Retainability)**								
	a) CDR	<=2%	1.15%	0.81%	2.00%	1.56%	0.33%	1.51%	0.82%
	b) Worst affected cells>3% TCH drop	<=3%	6.21%	1.65%	4.84%	2.94%	0.90%	4.61%	0.58%
	c) Good voice quality	>=95%	92.46%	98.68%	NA	96.78%	96.02%	97.50%	NA
	d) Total No. of cells exceeding 3% TCH drop (call drop)		326	116	141	40	23	147	5
	e) Total no. of cells in the network		5,250	7,017	2,915	1,346	2,547	3,186	860

4	No of POI's having >0.5% congestion		1	0	0	0	0	0	0
	a) Name of POI not meeting the benchmark		L1 TAX JAMMU	NIL	Nil	NIL	NIL	NIL	NIL
	b) Total No. of call attempts on POI (Avg.)		2283216	51549	12696	71981	8242	9245	1163
	c) Total traffic served on POI (Erlang) (Avg.)		690	857	178	2,079	195	191	28
	d) Total No. of circuits on POI		55070	53060	19124	151080	7864	22776	8205
	e) Total number of working POI Service Area wise		46	32	22	14	20	39	38
	f) Capacity of POI		55174	51300	13387	136770	7180	19879	7373
5	**Network Data**								
	a) Equipped Capacity of Network Erlang		110840	133209	61000	11306	40000	23973	35260
	b) Total traffic in TCBH in erlang (Avg.)		51585	81575	64397	3986	15776	18081	10664
	c) Total no. of customers served (as per VLR) on last day of the month		1377733	1488759	NR	113926	NR	416131	81646
(B)	**Customer Service Quality Parameters**								
5	**Metering/billing credibility-Post paid**	*<= 0.1%*	0.00%	0.01%	0.10%	0.00%	0.10%	0.00%	0.00%
	a) No. of bills issued during the period		285102	53696	797652	7541	24168	20201	16537
	b) No. of bills disputed including billing complaints during the period		0	6	788	0	25	1	0
6	**Metering /billing credibility-Pre paid**	*<= 0.1%*	0.04%	0.02%	0.06%	0.05%	0.01%	0.02%	0.00%

	a) No. of charging / credit / validity complaints during the quarter		615	468	343	58	48	103	1
	b) Total no. of pre-paid customers at the end of the quarter		1,619,349	2,146,502	572,269	113,513	441,894	506,123	82,310
7	**Resolution of billing/ charging complaints**	*100% within 4 weeks*	100%	100%	99.56%	100%	100%	100%	100%
	a) No. of billing/(post paid) and charging, credit/validity (pre paid) complaints resolved within 4 weeks during the quarter		615	6505	1126	310	73	104	22
	b) Total no. of billing (post paid) and charging, credit / validity (pre paid) complaints received during the quarter		615	6505	1131	310	73	104	22
	c) No. of billing complaints (post paid) and charging, credit/ validity complaints (pre paid) resolved in favour of the customer during the quarter		615	474	1126	247	25	67	1
	d) No. of complaints disposed on account of not considered as valid complaints during the quarter		0	6031	5	63	48	37	21
	e) Period of applying credit/waiver/adjustment to the customer's account from the date of resolutions of complaints	*<=1 week*	1Week	1Week	1Week	1week	1week	1week	1week
8	**Response time to customers for assistance**								
	a) Accessibility of call centre/Customer Care	*>=95%*	93.56%	93.49%	100%	100%	100%	100%	99.88%
	b) % call answered by operators(voice to voice) within 60 sec.	*>=90%*	93.16%	93.50%	95%	96%	92%	95%	95%
	c) Total no. of call attempts to call centre & customer care nos. during TCBH (Avg.).		1,736019	16844772	96,149	274382	30,232	45345	26,425
	d) No. of calls connected and answered successfully to call centre & customer care nos. during TCBH (Avg.).		1624175	15748539	96149	274382	30232	45345	26394

9	**Termination/closure of service**	*<=7days*	100%	100%	100%	100%	100%	100%	100%
	a) Total No. of requests for Termination / Closure of service received during the quarter		174	282	15,463	105	126	97	427
	b) No. of requests for Termination / Closure of service complied within 7 days during the quarter		174	282	15,463	105	126	97	427
10	**Time taken for refunds of deposits after closures.**	*100% within 60 days*	100%	100%	100%	100%	100%	100%	100%

NA: Not Applicable, NR: Not Received

Parameter-wise Findings (Month Data Assessment):

The parameter wise key takeouts for the Cellular Mobile Telephone Services providers in Jammu & Kashmir Service Area are as given below:-

➢ **BTS accumulated downtime (benchmark <=2%):** All operators are meeting the benchmark with values lying between 0% and 1.95%.

➢ **Worst affected BTSs due to downtime (benchmark <= 2%):** All operators are meeting the benchmark with values lying between 0% and 1.97%.

➢ **Call setup success rate (benchmark >= 95%):** All operators are meeting the benchmark with values lying between 96.20% and 99.34%.

➢ **SDCCH/PAGING Channel congestion (benchmark <= 1%):** All operators are meeting the benchmark with values lying between 0% and 0.90%.
   Note: CDMA operators have provided the data for Paging Channel congestion and GSM operators provided SDCCH Channel congestion.

➢ **TCH congestion (benchmark <= 2%):** Except Aircel with a value of 3.25% rest of the operators are meeting the benchmark with values lying between 0.16% and 1.90%.

➢ **Call drop rate (benchmark <= 2%):** All operators are meeting the benchmark with values lying between 0.33% and 2.00%.

➢ **Cell exceeding 3% TCH drop (benchmark <= 3%):** Except Aircel , BSNL and Vodafone with the values of 6.21%, 4.84% and 4.61%, all the operators are satisfying the benchmark with value in between 0.58% and 2.94%.

➢ **Connections with good voice quality (benchmark >= 95%):** Except for Aircel with the value of 92.46%, all the operators are meeting the benchmark with values lying between 96.02% and 98.68%.

➢ **No. of POI's having>0.5%congestion:** Except Aircel, having congestion in 1 POI ,rest of the operators are meeting the benchmark. There was no congestion found overall on the POI, but cases were found where individual POIs are showing high utilization/usage. Some are in the range of over 100% though causing no traffic failure due to overflow technique i.e. the extra traffic is carried over by some other operating POI as has been designed to do so.

➢ **%age of call answered by operator (electronically) (benchmark >95):** Except for Airtel with a value of 93.49% and Aircel with a value of 93.56%, all operators are meeting the benchmark with values lying b/w 99.88% to 100%.

➢ **%age of call answered by operator (Voice to voice) (benchmark >90%): %):** All operators are meeting the benchmark with values lying between 92.00% and 96.00%.

➢ **Metering and billing credibility-Post paid (benchmark <= 0.1%):** All the operators are meeting the benchmark with values lying between 0% and 0.10%.

➢ **Metering and billing credibility-Pre paid (benchmark <= 0.1%):** All the operators are meeting the benchmark with values lying between 0% and 0.06%.

➢ **Resolution of billing/ charging complaints (benchmark 100% within 4 weeks):** All operators are meeting the benchmark except for BSNL with value of 99.56%.

➢ **Termination/Closure of service (Benchmark <= 7 days):** All operators have satisfied the benchmark.

➢ **Time taken for refunds of deposits after closures (benchmark 100% within <=60 days):** All operators have satisfied the benchmark.

(1)   Sample Coverage

Switches/BSC/BTS details of operators:

Sl.	Name of Service Provider	No. of MSC	No. of BSC	No. of BTS
GSM Operators				
1	Aircel Ltd	4	21	1750
2	Airtel Ltd	11	26	2399
3	BSNL	5	20	1068
4	Idea	1	2	455
5	Reliance Communication (GSM)	2	5	849
6	Vodafone	2	13	1088
CDMA Operators				
7	Tata Communications (CDMA)	2	2	268

(2)   Performance (Graphical Representation)
Comparison between Live measurements and One month data Audit – Cellular Mobile Telephone Services

A)   NETWORK PERFORMANCE

I. **Call setup success rate:** All operators are meeting the TRAI benchmarks (>= 95 %) for both one month data and 3 days live data taken in the month of audit.

	Aircel	Airtel	BSNL	Idea	Rcom GSM	Vodafone	Tata CDMA
Live	96.41%	99.18%	98.00%	99.30%	99.48%	99.80%	99.26%
Month	96.20%	99.15%	98.00%	99.34%	99.47%	99.69%	99.28%
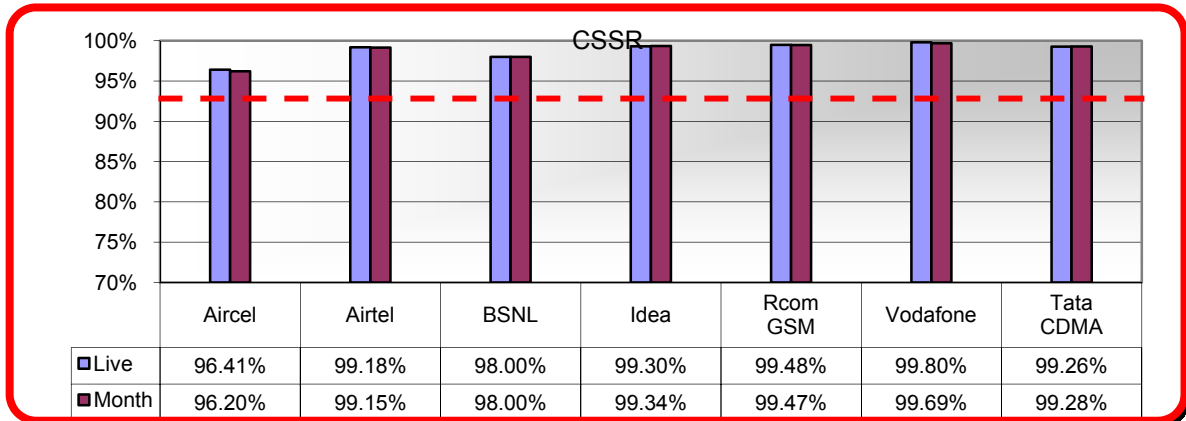
II. **Blocked call rate:**

SDCCH congestion (%): For month data, all operators are meeting the TRAI benchmarks (<= 1 %) for both one month data and 3 days live data taken in the month of audit.

	Aircel	Airtel	BSNL	Idea	Rcom GSM	Vodafone	Tata CDMA
Live	0.52%	0.17%	0.90%	0.18%	0.17%	0.29%	0.00%
Month	0.49%	0.14%	0.90%	0.17%	0.15%	0.27%	0.00%
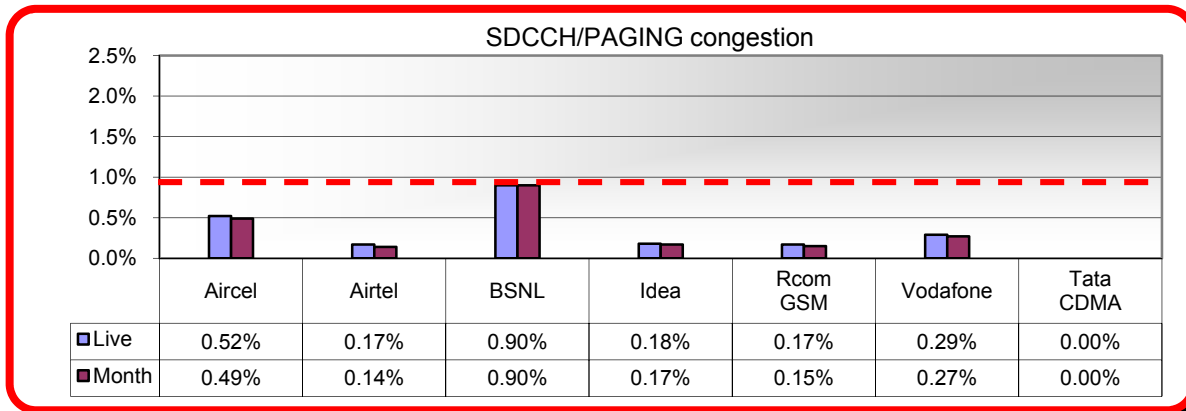
TCH congestion (%): For both live & month data, except for Aircel, All other operators are meeting the TRAI benchmarks (<= 2%) for both one month data and 3 days live data taken in the month of audit.

	Aircel	Airtel	BSNL	Idea	Rcom GSM	Vodafone	Tata CDMA
Live	3.01%	0.20%	1.90%	0.11%	0.91%	0.20%	0.15%
Month	3.25%	0.17%	1.90%	0.21%	0.77%	0.31%	0.16%

III.   Connection Maintainability (Retainability):

Call drop rate (<=2%): All operators are meeting the TRAI benchmarks (<=2%) for both one month data and 3 days live data taken in the month of audit.

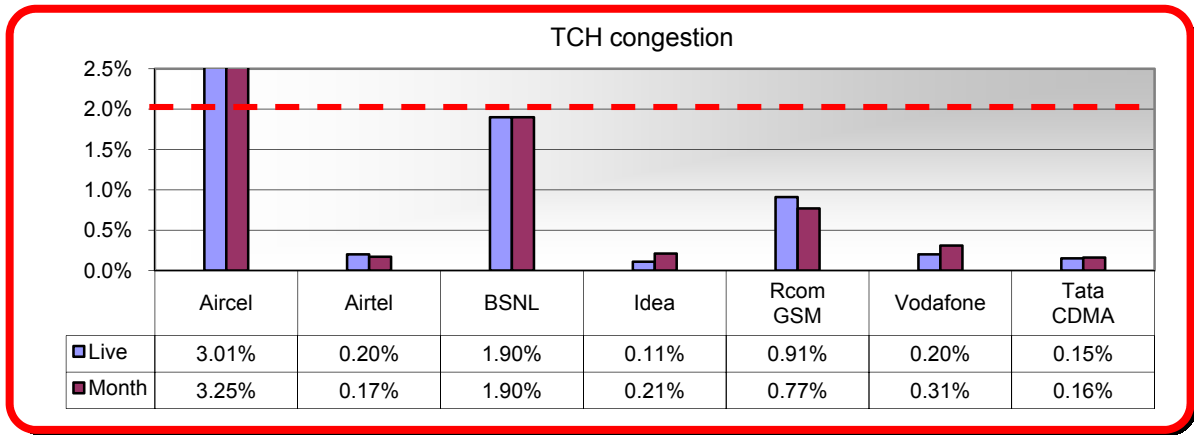|	Aircel	Airtel	BSNL	Idea	Rcom GSM	Vodafone	Tata CDMA
Live	1.20%	0.83%	2.00%	1.77%	0.33%	1.60%	0.73%
Month	1.15%	0.81%	2.00%	1.56%	0.33%	1.51%	0.82%

Worst affected Cell exceeding 3% TCH Drop: For both live and month data, Aircel with a value of 6.72% and 6.21%,BSNL with a value of 4.60% and 4.80%,and Vodafone with a value of 4.58% and 4.60% respectively is found not meeting the benchmark of <=3%. Rests of the operators are meeting the benchmark for both cases.

	Aircel	Airtel	BSNL	Idea	Rcom GSM	Vodafone	Tata CDMA
Live	6.72%	1.34%	4.60%	2.72%	0.81%	4.58%	0.47%
Month	6.21%	1.53%	4.80%	2.94%	0.90%	4.60%	0.57%

Percentage of connections with good voice quality (benchmark >= 95%): Only Aircel with the value of 92.01% for 3 days live data and 92.46% for one month data is not meeting the benchmark, rest all the operators are meeting the TRAI benchmarks (=> 95%) for both one month data and 3 days live data taken in the month of audit. BSNL has not provided the data instead the operator has written that BO template not available with BSNL.
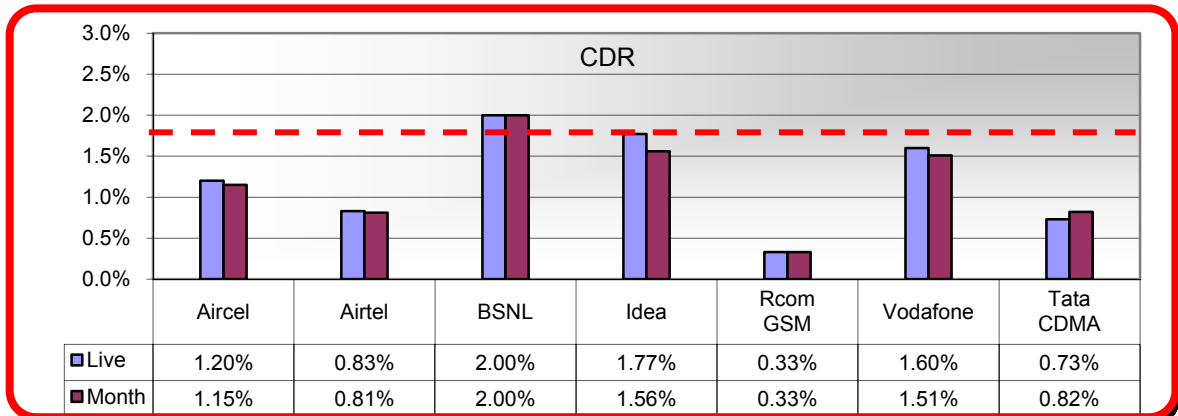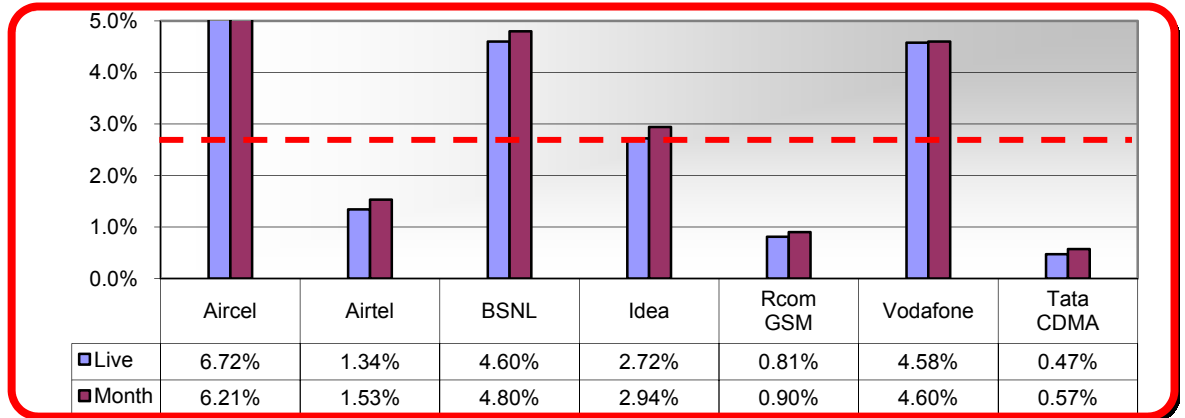
Connections with good voice quality

	Aircel	Airtel	Idea	Rcom GSM	Vodafone
Live	92.01%	98.91%	96.49%	96.51%	97.56%
Month	92.46%	98.68%	96.78%	96.02%	97.50%

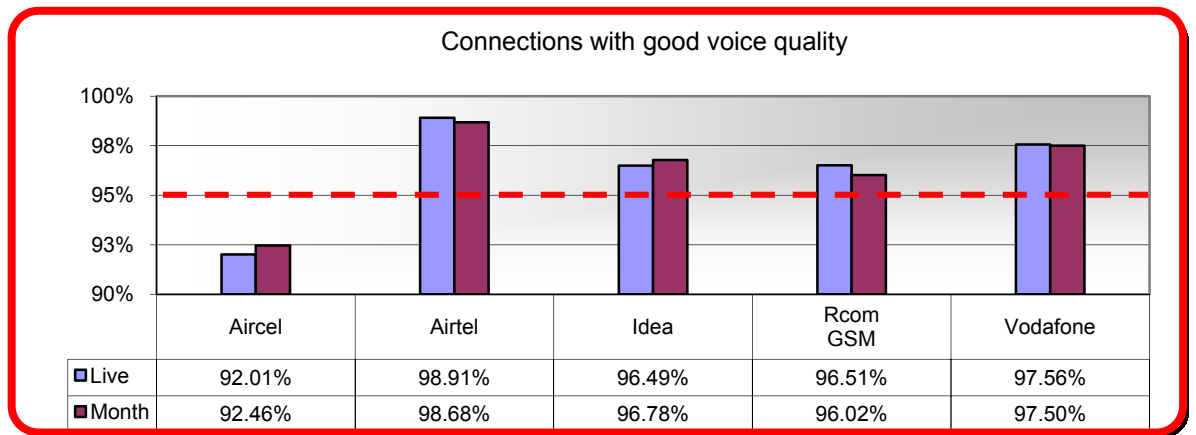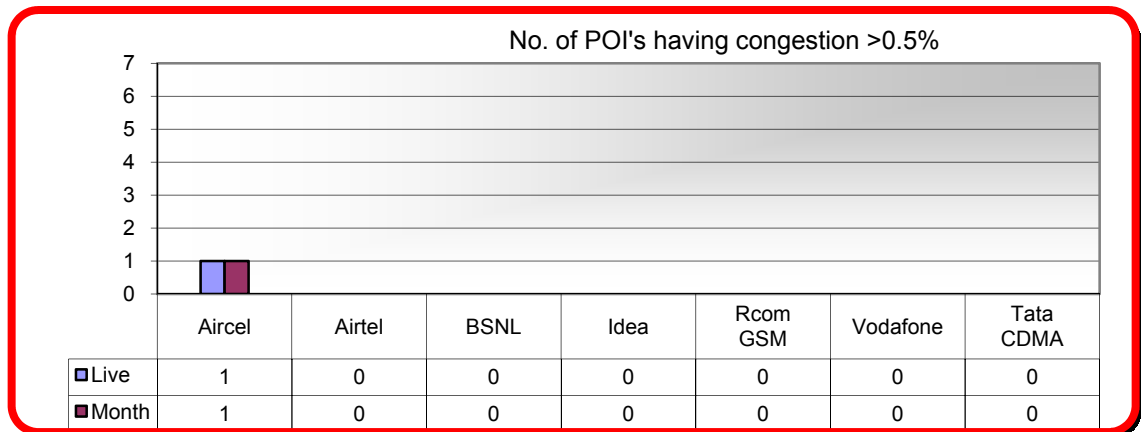**No. of POI's having >0.5% Congestion:** Except for Aircel (both live & month data), rest all other operators are meeting the TRAI benchmarks (<= 0.5%) for both one month data and 3 days live data taken in the month of audit.

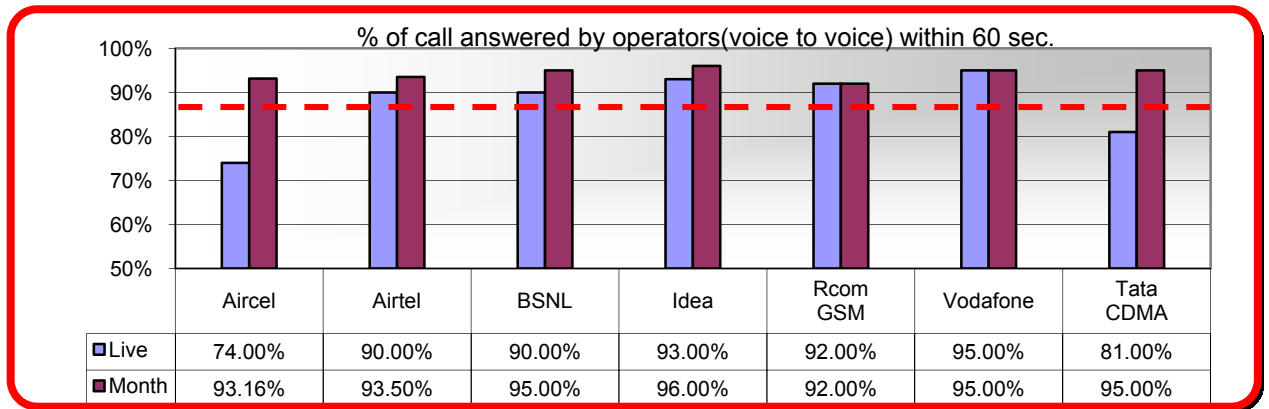**No. of POI's having congestion >0.5%**

	Aircel	Airtel	BSNL	Idea	Rcom GSM	Vodafone	Tata CDMA
Live	1	0	0	0	0	0	0
Month	1	0	0	0	0	0	0

B)   CUSTOMER SERVICE QUALITY PARAMETERS

(A)   Response time to the customer for assistance:

Percentage of call answered (Electronically): All operators are meeting the TRAI benchmarks (>= 95%) for both one month data and 3 days live data taken in the month of audit except for Airtel in month data audit (93.49%) and Aircel in month data audit(93.56%).

Accessibility of call centre/customer care

	Aircel	Airtel	BSNL	Idea	Rcom GSM	Vodafone	Tata CDMA
Live	100%	95%	100%	100%	100%	100%	98%
Month	93.56%	93.49%	100%	100%	100%	100%	99.88%
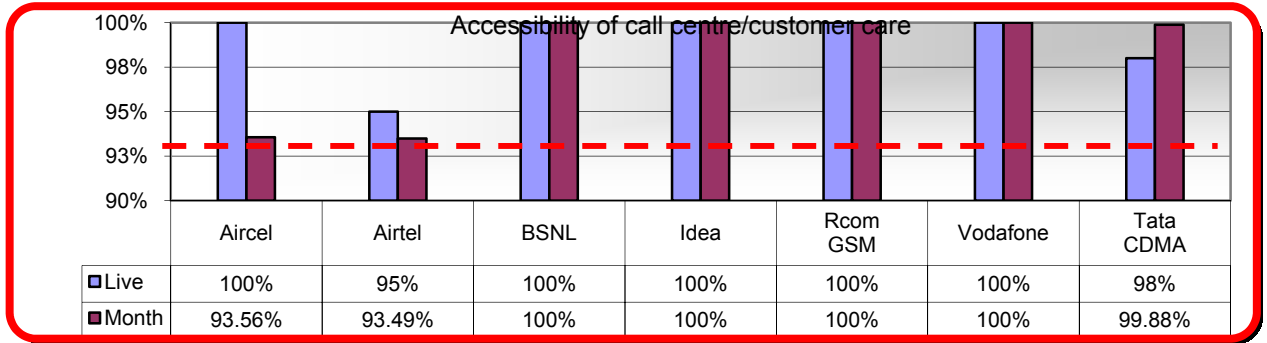
Percentage of call answered by operators (Voice to voice) within 60 sec: For Live data, only Aircel and Tata CDMA are not meeting the benchmark. Rest all other operators are meeting benchmark for both live and month data audit.

% of call answered by operators(voice to voice) within 60 sec.

	Aircel	Airtel	BSNL	Idea	Rcom GSM	Vodafone	Tata CDMA
Live	74.00%	90.00%	90.00%	93.00%	92.00%	95.00%	81.00%
Month	93.16%	93.50%	95.00%	96.00%	92.00%	95.00%	95.00%

(3)   Critical Analysis

The above comparative study between live data & month data shows similar trends in both the cases. However, inconsistency in live & month data was found for parameters like "POI congestion" (Aircel), "accessibility of call centre" (Airtel) and "%age of calls answered by operator" (Aircel & Tata CDMA).

(B) Redressal

(1)   Sample coverage

A sample of billing complaints was taken for each operator and calls were made for assessing the resolution of billing/charging complaints within 4 weeks as claimed by the respective operators.

(2)   Performance (live calling for billing complaints)

Calling Operator	Aircel	Airtel	BSNL	Idea	Reliance (GSM)	Vodafone	Tata (CDMA)
Total No. of calls	6	15	9	8	9	12	6
Cases resolved with 4 weeks	6	15	9	8	9	12	6
%age of cases resolved	100%	100%	100%	100%	100%	100%	100%

(3)   Live calling to call center:
Fifty nos. of calls were made at Jammu in each half and below given no. of calls got connected to the call center within 60 sec.

	OPERATORS NAME						
	Aircel	Airtel	BSNL	Idea	Rcom	Vodafone	Tata
	GSM						CDMA
1ST HALF (10AM TO 01 PM)	40	39	43	42	46	44	46
2ND HALF (04PM TO 07 PM)	37	36	46	40	41	40	47
In % age	77.00	75.00	89.00	82.00	87.00	84.00	93.00

(4) Level 1 Calling: Level 1 calling such as calling at emergency no. (Police, Fire, Hospital), Railway enquiry system etc were made so as to check the service of such short codes. In Jammu it was found to be functional.

(5)   Critical Analysis
Random numbers were selected from the operators' database of billing/metering complaints and calls were made to the customers to get their feedback for complaint Redressal. It was found that the operators had made refunds in 100% cases as claimed by their records.

(C)   Inter operator call assessment

(1)   Sample coverage

A sample of 2x50 test calls per Service Providers with in the licensed service area (Jammu & Kashmir Circle) were made between 1100 to 1400 hrs and between 1900 to 2100 hrs so that TCBH hours for all the operators were covered.

(2)   Performance based on live measurement

Calling Operator	Aircel	Airtel	BSNL	Idea	Reliance (GSM)	Vodafone	Tata (CDMA)
Aircel	-	97%	99%	100%	100%	100%	100%
Airtel	100%	-	100%	100%	100%	100%	100%
BSNL	100%	99%	-	100%	98%	100%	100%
Idea	100%	100%	100%	-	100%	100%	100%
Reliance (GSM)	98%	100%	97%	100%	-	100%	100%
Vodafone	99%	100%	97%	100%	98%	-	100%
Tata (CDMA)	100%	100%	100%	100%	100%	100%	-

(3)   Critical Analysis

In the inter-operator call assessment test, calls were made from one operator to other operators so as to check congestion on both the operators' network. In such cases, the radio part, switch part & the POI in-between the operators are involved and hence if any congestion is found in the network, it may be due to any of these parts. The result shows that there is not much congestion on the operator networks.

(D)   **Drive test of the mobile network of service providers**

(1) Sample Coverage

The Operator Assisted Drive Test was conducted at Jammu, Baramulla & Srinagar for all the operators. Route covered was about around 100-130 Km depending on city areas within the speed limit of 30Km/hr.

Drive Test Locations

JAMMU

LOW DENSE:	Airport, Satwari, BSF camp.
MEDIUM DENSE:	Gandhi Nagar, Channi Himmat, Trikuta Nagar.
HIGH DENSE:	Bahu plaza, PTU, Bikram chowk, Jeewal Chowk, Bus Stand, Raghunath Bazaar.

SRINAGAR

LOW DENSE:	Pantha Chowk to Law Arpor.
MEDIUM DENSE:	Karan Nagar, Nowhata, Soura, Lal Bazar, Dal Gate, Boulevard, CM House, Mughal Gardens
HIGH DENSE:	Hyderpora, Bemina, Lal Chowk.

BARAMULLA-SOPORE

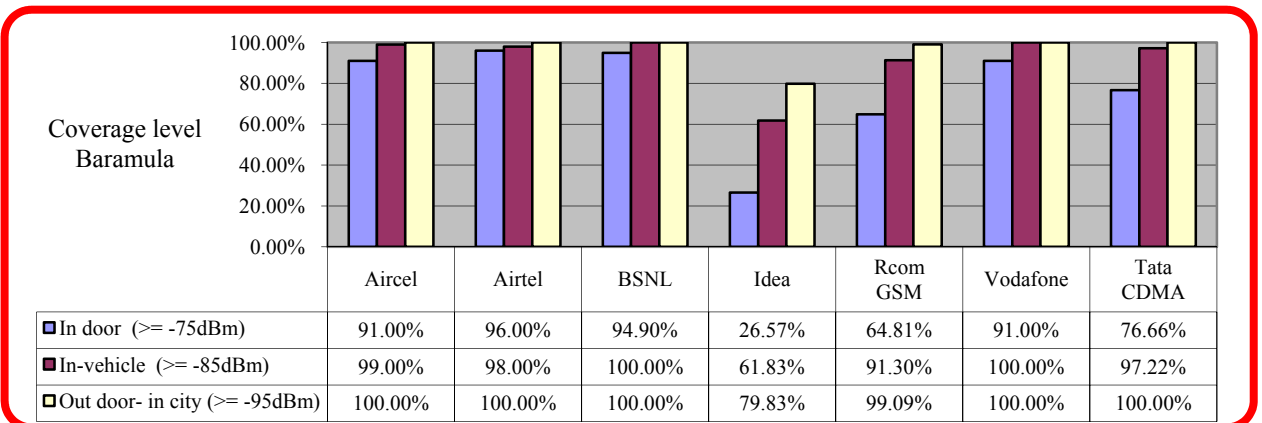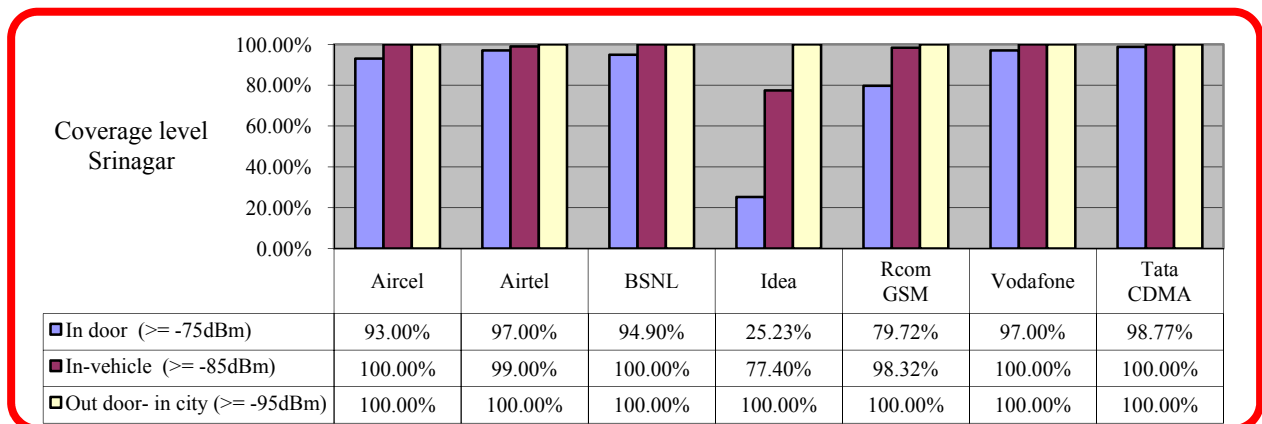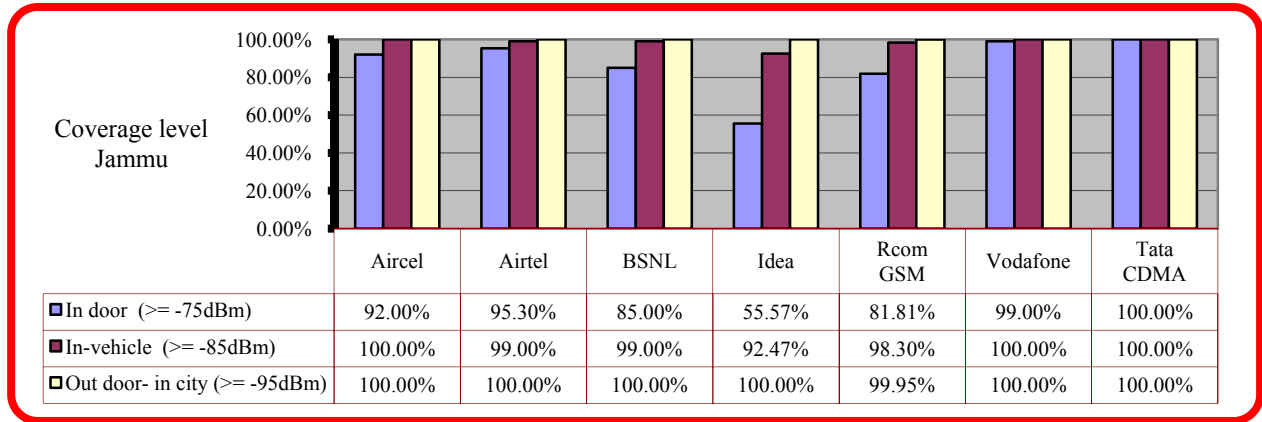|	
LOW DENSE:	Narbal, Srinagar-Sopore-Baramulla National Highway
MEDIUM DENSE:	Pattan, Hanjiwera, Dakbanglow,Baramullaexchange,BaramullaHospital,Uri Bus stand
HIGH DENSE:	Sangrama,Sopore Exchange, New Colony Sopore,Noor bagh main Bazaar

2)   Performance (for the respective cities)

SN	Parameter	City Name	Aircel	Airtel	BSNL	Idea	Rcom GSM	Vodafone	Tata CDMA
			GSM Operators						
1.1	Call Attempts	Jammu	188	104	137	175	196	162	178
		Srinagar	163	123	161	176	126	139	154
		Baramulla	110	121	139	134	101	107	132
1.2	Blocked Call Rate (<=3%)	Jammu	1.06%	0%	1.45%	1%	3.06%	0%	0%
		Srinagar	0.00%	0%	1.24%	0%	1.58%	3.59%	0%
		Baramulla	0.00%	0%	1.43%	1%	1.98%	0%	1%
1.3	Dropped Call Rate (<=2%)	Jammu	0%	0%	1.45%	0%	1.02%	0%	1.68%
		Srinagar	0%	0%	1.24%	1%	2.38%	0%	1.94%
		Baramulla	0%	1%	0.71%	0%	0%	0.93%	0%
1.4	Percentage of connections with good voice quality (=>95%)								
	(i) 0-4 (w/o frequency hopping)	Jammu							91.43%
		Srinagar							92.00%
		Baramulla							93.50%
	(ii) 0-5 (with frequency hopping)	Jammu	94.90%	96.70%	97.10%	95.80%	94.99%	98.30%	
		Srinagar	95.35%	95.40%	95.70%	96.46%	92.64%	97.84%	
		Baramulla	94.29%	97.30%	95.65%	98.03%	96.41%	99.50%	
1,5	Service Coverage								
	In door (>= -75dBm)	Jammu	92.00%	95.30%	85.00%	55.57%	81.81%	99.00%	100.00%
		Srinagar	93.00%	97.00%	94.90%	25.23%	79.72%	97.00%	98.77%
		Baramulla	91.00%	96.00%	94.90%	26.57%	64.81%	91.00%	76.66%
	In-vehicle (>= -85dBm)	Jammu	100.00%	99.00%	99.00%	92.47%	98.30%	100.00%	100.00%
		Srinagar	100.00%	99.00%	100.00%	77.40%	98.32%	100.00%	100.00%
		Baramulla	99.00%	98.00%	100.00%	61.83%	91.30%	100.00%	97.22%
	Outdoor- in city (>= -95dBm)	Jammu	100.00%	100.00%	100.00%	100.00%	99.95%	100.00%	100.00%
		Srinagar	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		Baramulla	100.00%	100.00%	100.00%	79.83%	99.09%	100.00%	100.00%
1.6	Call Setup Success Rate (>=95%)	Jammu	99.98%	100.00%	98.55%	99.00%	96.94%	99.39%	100.00%
		Baramulla	100.00%	99.00%	98.00%	99.00%	98.02%	100.00%	99.24%
		Srinagar	100.00%	100.00%	96.90%	100.00%	98.42%	95.68%	100.00%

Graphical Representation

Coverage level Jammu	Aircel	Airtel	BSNL	Idea	Rcom GSM	Vodafone	Tata CDMA
In door (>= -75dBm)	92.00%	95.30%	85.00%	55.57%	81.81%	99.00%	100.00%
In-vehicle (>= -85dBm)	100.00%	99.00%	99.00%	92.47%	98.30%	100.00%	100.00%
Out door- in city (>= -95dBm)	100.00%	100.00%	100.00%	100.00%	99.95%	100.00%	100.00%

Coverage level Srinagar	Aircel	Airtel	BSNL	Idea	Rcom GSM	Vodafone	Tata CDMA
In door (>= -75dBm)	93.00%	97.00%	94.90%	25.23%	79.72%	97.00%	98.77%
In-vehicle (>= -85dBm)	100.00%	99.00%	100.00%	77.40%	98.32%	100.00%	100.00%
Out door- in city (>= -95dBm)	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Coverage level Baramula	Aircel	Airtel	BSNL	Idea	Rcom GSM	Vodafone	Tata CDMA
In door (>= -75dBm)	91.00%	96.00%	94.90%	26.57%	64.81%	91.00%	76.66%
In-vehicle (>= -85dBm)	99.00%	98.00%	100.00%	61.83%	91.30%	100.00%	97.22%
Out door- in city (>= -95dBm)	100.00%	100.00%	100.00%	79.83%	99.09%	100.00%	100.00%

(3)   Critical Analysis

The drive test data was found to be satisfactory for most of the parameters. However, a few deviations found are listed below:

- Blocked Call Rate benchmark is not met by Rcom GSM in Jammu (3.06%) & Vodafone in Srinagar (3.59%).
- Tata is meeting benchmarks except Percentage of connections with good voice quality in all 3 cities.
- Aircel is meeting benchmarks except Percentage of connections with good voice quality in Jammu and Baramulla.
- Rcom GSM is not meeting the benchmark of Percentage of connections with good voice both in Jammu and Srinagar having the values of (94.99%) and (92.64%) respectively and is also not meeting the prescribed benchmark of 2.00% in the case of CDR exceeding 0.38%.

(E)   Independent Drive Test

(1) Sample Coverage

The Independent Drive Test was conducted at Srinagar after operators assisted drive test was over for respective operators. Route cover was about around 130Km depending on city areas within the speed limit of 30Km/hr.

Drive Test Locations

SRINAGAR

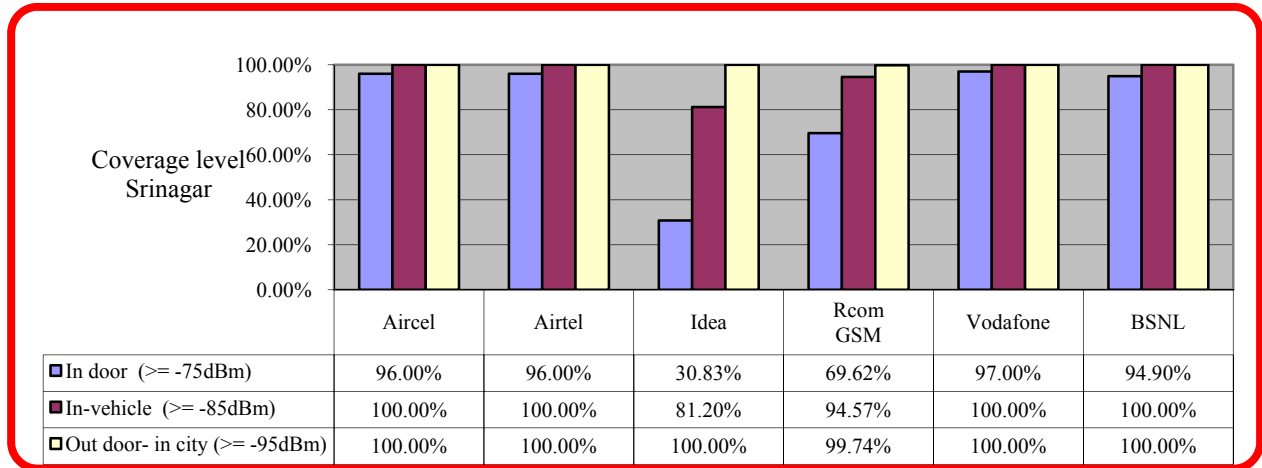LOW DENSE: Pantha Chowk to Law Arpor.

MEDIUM DENSE: Karan Nagar, Nowhata, Soura, Lal Bazar ,Dal Gate, Boulevard, CM House,Mughal Gardens

HIGH DENSE: Hyderpora, Bemina,Lal Chowk.

2) Performance (for the respective cities)

SN	Parameter	City Name	Aircel	Airtel	Idea	Rcom GSM	Vodafone	BSNL
			GSM Operators					
1.1	Call Attempts							
		Srinagar	172	108	107	175	124	180
1.2	Blocked Call Rate (<=3%)							
		Srinagar	0%	0%	0%	1.14%	2.41%	1.11%
1.3	Dropped Call Rate (<=2%)							
		Srinagar	0%	0%	0%	0.00%	0.00%	1.11%
	Percentage of connections with good voice quality (=>95%)							
1.4	(i) 0-4 (w/o frequency hopping)	Srinagar						
	(ii) 0-5 (with frequency hopping)	Srinagar	95.93%	96.80%	95.66%	95.18%	98.50%	96.00%
1.5	In door (>= -75dBm)							
		Srinagar	96.00%	96.00%	30.83%	69.62%	97.00%	94.90%
	In-vehicle (>= -85dBm)							
		Srinagar	100.00%	100.00%	81.20%	94.57%	100.00%	100.00%
	Outdoor- in city (>= -95dBm)							
		Srinagar	100.00%	100.00%	100.00%	99.74%	100.00%	100.00%
1.6	Call Setup Success Rate (>=95%)	Srinagar	100.00%	100.00%	100.00%	98.86%	95.68%	97.78%

Graphical Representation

Coverage level Srinagar	Aircel	Airtel	Idea	Rcom GSM	Vodafone	BSNL
In door (>= -75dBm)	96.00%	96.00%	30.83%	69.62%	97.00%	94.90%
In-vehicle (>= -85dBm)	100.00%	100.00%	81.20%	94.57%	100.00%	100.00%
Out door- in city (>= -95dBm)	100.00%	100.00%	100.00%	99.74%	100.00%	100.00%

(3) Critical Analysis

- All the operators are meeting the prescribed Benchmark in Srinagar.

(F)   Compliance report (Status of service providers with respect to the QoS)

From live, month, PMR and Drive Tests findings, it can be concluded that on an average, performance of the operators in the service area (Jammu & Kashmir) is by and large satisfactory for **Network Parameters**. However, the benchmark of <=3% for "worst affected cells >3% TCH drop" is not met by Aircel, BSNL and Vodafone

(for both month & live data) .In the case of TCH congestion only Aircel is not meeting the benchmark(3.01% & 3.25% for both Live and Month data respectively).

Under **Customer Service Quality Parameter** "operator answered calls (voice-to-voice) within 60 seconds" parameter it is found that most of the operators are fulfilling TRAI benchmark of >=90%. Except Aircel and Tata CDMA (74% and 81% respectively) for Live Data. Apart from this, the "accessibility of call centre" parameter benchmark is not met by Airtel (month data).

During **Drive Tests**, high Blocked Call Rates were found in case of Rcom GSM (Jammu) and Vodafone (Srinagar). Most of the GSM operators have below benchmark %age of connections with good voice quality. Rcom GSM is seen to have a very low %age of connection with good voice quality (92.64%) in Srinagar which is less than the TRAI benchmark of 95% as the operator has remarked that this is due to no sites(permission not granted by Local authorities to construct Mobile towers around Dal Lake).

III.   Basic Telephone Service (Wire line) Providers
……..Audit not done for this quarter

IV.   Broadband Service Providers
……..Audit not done for this quarter